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ADVANCING SCIENTIFIC EFFORTS TO CONTROL HPV-RELATED CANCERS

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ABSTRACTS

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Exploring the interplay of the vaginal microbiome, cervical cytology and HPV testing

18 - Microbiome

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Background/Objectives: This study evaluates the prevalence of different Lactobacilli species as a key component of the vaginal microbiome and their association with high-risk human papillomavirus (hrHPV) and cervical cytology outcomes.

Methods: A total of 166 reproductive-age women undergoing routine gynecological examinations at our hospital were included. Exclusion criteria comprised pregnancy, menstrual bleeding, other types of uterine or vaginal bleeding, recent antibiotic treatment (within one month), sexual intercourse (within three days), recent use of vaginal products, and transvaginal interventions (conization, biopsy, hysterosalpingography, hysteroscopy, and curettage) within the past month. Following informed consent, cervical and vaginal samples were collected with sterile swabs and sent for molecular identification of Lactobacillus species, which was analyzed at the Research Center for Genetic Engineering and Biotechnology using polymerase chain reaction (PCR) amplification of 16S rRNA genes and sequencing. A total of 147 women underwent liquid-based cytology (LBC), and 46 were analyzed for hrHPV.

Results: Positive cytology results were observed in 42 out of 147 women (28.6%). Among these, 32 had low-grade squamous intraepithelial lesions (SIL) (2 HPV; 29 CIN1), with Lactobacillus iners being the most prevalent Lactobacillus (19/ 59.34%), compared to Lactobacillus crispatus and Lactobacillus casei (3/ 9.37%). Four women exhibited atypical squamous cells of undetermined significance (ASCUS), three with Lactobacillus iners and one with a combination of Lactobacillus crispatus and Lactobacillus casei. Five had high-grade SIL (three CIN2 and two CIN3), where Lactobacillus iners was identified in two CIN2 cases, and in one CIN3 case; Lactobacillus delbrueckii in one CIN 3 case. One case of atypical glandular cells (AGC,NOS) had Lactobacillus crispatus and Lactobacillus casei and was hrHPV negative. Among the 46 hrHPV analyses, 30 were positive, with Lactobacillus iners most frequently associated with hrHPV (16/ 53.33%). Conversely, Lactobacillus crispatus was more prevalent among hrHPV-negative cases (7/ 43.75%). Notably, twelve hrHPV-positive women, treated with local application of carboxymethyl beta-glucan, tested negative upon follow-up 6-12 months later, with microbiome shifts from Lactobacillus iners to Lactobacillus gasseri and Lactobacillus crispatus observed in two cases.

Conclusions: Lactobacillus iners was more frequently identified in women with hrHPV compared to Lactobacillus crispatus, while Lactobacillus gasseri was exclusively identified in hrHPV-negative women. This interplay among different Lactobacillus species within the vaginal microbiome and their relationship with HPV, along with various other factors, is complex. However, ongoing research in this area holds significant promise for developing new screening methods aimed at predicting and preventing cervical cancer.